

REMARKS

Reconsideration of this application is respectfully requested in view of the foregoing amendment and the following remarks.

In the Office Action, claims 1-5, 7, 1-20, and 22 were rejected under 35 U.S. C. § 102(b) as being anticipated by U.S. Patent No. 5,323,456 to Oprea ("Oprea"). Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Oprea in view U. S. Patent 5,802,187 to Hsu ("Hsu"). Claims 8-11, 13-15, and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Oprea in view U. S. Patent No. 4,644,106 to Yeh ("Yeh"). Claims 12, 16, and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Oprea in view Yeh and further in view of Hsu.

In this Amendment, independent claims 1, 7, 8, 13, and 18 have been amended to clarify the present invention. Claims 3-6, 10-12, 14-16, and 19-21 have been amended to correct matters of form.

One feature of the present invention, as recited in amended independent claims 1 and 7, is a method for modulating the volume of a first, audible tone signal by controlling the duty cycle of a second, high frequency signal that is applied the first signal. In particular, claim 1 recites "generating a second signal where the second signal is a digital pulse train signal with a mark-space ratio (duty cycle) of less than 100%, where the frequency of the second signal is higher than the frequency of the first signal; modulating the amplitude of the first signal with the digital pulse train signal to generate an output signal . . . ". The mark-space ratio of the high frequency signal, and therefore the volume of the modulated signal can be varied in multiples of the ratio of

frequencies between two high frequency clocks used to generate the high frequency signal: “wherein the frequency of the second signal is determined by a first clock frequency, and the mark space ratio of the second signal is a multiple of a ratio of the first clock frequency to a second clock frequency that is higher than the first clock frequency. . . ” Support for this amendment is provided by Figure 2 that discloses, for example, 64 KHz clock 120 and 1024 KHz clock 130 that are used to create the high frequency digital pulse train having the variable mark space ration.

Similarly, claim 7 recites a method for generating a ringing signal where a full volume telephone ringing signal is multiplied by “ a pulse train signal with mark-space ratio less than 100% to generate an output signal,. . . where the mark-space ratio of the pulse train signal is dependent upon the selected desired ring volume level, wherein the frequency of the pulse train signal is determined by a first clock frequency, and the mark space ratio of the pulse train signal is a multiple of a ratio of the first clock frequency to a second clock frequency that is higher than the first clock frequency. . . ”.

Similarly, claim 18 recites a circuit that contains a digital pulse train generator that produces a mark space ratio in a pulse train that is a multiple of ratios of two clock frequencies: “a digital pulse train generator outputting a pulse width modulated pulse train signal with a mark-space ratio less than 100%, where the pulse width modulated pulse train signal has a frequency higher than a frequency of the full volume ringing signal; . . . wherein the frequency of the pulse width modulated pulse train signal is determined by a first clock frequency, and the

mark space ratio of the pulse width modulated pulse train signal is a multiple of a ratio of the first clock frequency to a second clock frequency that is higher than the first clock frequency.”

Oprea teaches a method of producing a ringing signal by producing a high frequency pulse signal of a predetermined pulse width and modulating the high frequency signal with a low frequency signal at the ringing tone frequency (see abstract). While Oprea teaches that pulse lengths of the high frequency signal can be less than 100%, Oprea fails to teach the feature of the present invention recited in amended claims 1 and 7, where “the mark space ratio of the (high frequency) signal is a multiple of a ratio of the first clock frequency to a second clock frequency that is higher than the first clock frequency.” Accordingly, Applicants respectfully submit that upon entry of this amendment, claims 1, 7 and 18 will be in allowable form.

Amended claims 8 and 13 recite subject matter similar to amended claim 18. In particular, the latter claims recite a telephone that contains a digital pulse train generator that outputs a pulse width modulated pulse train “wherein the frequency of the pulse width modulated pulse train signal is determined by a first clock frequency, and the mark space ratio of the pulse width modulated pulse train signal is a multiple of a ratio of the first clock frequency to a second clock frequency that is higher than the first clock frequency.” As noted above, these features are not taught by Oprea. Yeh is directed towards an automatic ringer silencer. Yeh fails to teach the features of the present invention recited in claims 8 and 13 of modulating the volume of a ringer tone by employing a mark space ratio of a high frequency pulse train that is determined by the ratio of two high frequency clock frequencies: (“the mark space ratio of the (high frequency) signal is a multiple of a ratio of the first clock frequency to a second clock frequency that is

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higher than the first clock frequency"). Thus, whether taken singly or in combination, Oprea and Yeh fail to teach or suggest the limitations recited in amended claims 8 and 13. Accordingly, upon entry of this amendment, Applicants respectfully submit that claims 8 and 13 will be in allowable condition.

At least for the above reasons, claims 2-6, 9-12, 14-17, and 19-22, due to their dependence on allowable claims, should also be allowable.

In view of the foregoing all of the claims in this case are believed to be in condition for allowance. Should the Examiner have any questions or determine that any further action is desirable to place this application in even better condition for issue, the Examiner is encouraged to telephone applicants' undersigned representative at the number listed below.

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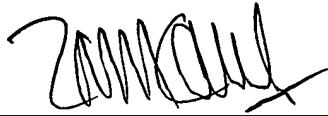
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Respectfully submitted,

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